Abdominal Muscle Tear in a Collegiate Volleyball Player

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Abstract
A female collegiate volleyball player sustained a tear to her rectus abdominis and external oblique muscles while serving a ball. Two and a half weeks later she underwent laparoscopic posterior abdominal wall reinforcement surgery. No complications arose from the surgery. Rehabilitation activities were started one week post-op with return to full activity five weeks post-op.

Background
The patient is a healthy 19-year-old (5’4”, 143 lb.) female collegiate volleyball player with no previous history of abdominal muscle injuries.

Her symptoms initially began at the beginning of the season while starting fall practice. At that time, the patient described the discomfort as just “soreness” that worsened as the season progressed.

A few weeks later the patient reported having an abrupt increase in pain that occurred during a serve attempt. She felt a tearing sensation in her left lower abdomen that made her previous symptoms significantly worsen.

No bruising was present but she did have minimal swelling. The patient was able to continue to play with limited movement due to pain.

She then saw a family medicine physician at a walk-in clinic who diagnosed the problem as an abdominal wall strain. At that time she was referred to the sports medicine clinic for further examination.

Differential Diagnosis
- Muscle strain, femoral hernia, inguinal hernia, ostetts pubis, pelvic stress fracture, hip arthritis, hip adductor muscle strain.

Treatment
- The patient initially saw a family physician at a walk-in clinic who diagnosed the problem as an abdominal wall strain. At that time she was referred to the sports medicine clinic for further examination. Anti-inflammatory and ice were recommended in the meantime.
- Three days later she met with a physician at the sports medicine clinic where she reported persistent soreness and pain with trunk extension, sit-ups, and any other time she engaged her abdominal muscles. She also reported having pain when running, jumping, or trying to set backwards. The pain was isolated to the left obliques and the hip flexor region without radiation. At that time an MRI was ordered to obtain further information (FIGURE 1).
- Initial treatment consisted of ice and rest with ultrasound and heat later being used. After one week, the MRI was reviewed and showed a tear in the left rectus abdominis muscle that extended across the linea alba into the left external oblique muscle. There was a 3.1 cm separation along the lateral margin of the rectus abdominis and a 1.1 cm separation along the medial margin. There was also a 0.4 cm separation of the left external oblique. The patient was then referred to a surgeon with previous experience with this type of injury.
- Approximately two and a half weeks after sustaining the injury, the patient underwent a bilateral laparoscopic posterior abdominal wall reinforcement surgery. After necessary resection was finished, a Progrip mesh was placed over the area within the peritoneum (FIGURE 2). No complications occurred during or following surgery.
- Approximately five weeks post-op, the patient was able to play volleyball, run two miles, and weight lift all with minimal pain.

FIGURE 1: MRI image revealing muscle tear in the left rectus abdominis and extending into the external oblique.

FIGURE 2: Images from laparoscopic reinforcement surgery. Notice the Progrip mesh that was used to enclose the abdominal hernia.

Conclusions
- Although abdominal muscle tears are uncommon, they must be considered as a possible diagnosis when working with athletes that experience a sudden increase in abdominal pain. With many abdominal organs lying beneath the musculature, it is also important to consider the possibility that the pain is coming from organ trauma or pathology.
- Like with any other athletic injury, a thorough history and physical exam is key to an accurate diagnosis of the problem. In most cases, referral to a physician is required so that the proper imaging and testing can take place. From there, surgical decisions can be made. Following surgical repair of an abdominal tear, the return to play decision is one that must be made congruently between the entire sports medicine staff.

Clinical Significance
- This case study is relevant because it demonstrates how an abdominal muscle tear can easily be misdiagnosed. Keeping the possibility of an abdominal muscle tear in mind is important for athletic trainers to remember, especially since athletes are more prone to this injury compared to the average population.
- Abdominal muscle tears should always be considered among the differential diagnosis of a patient presenting with abdominal pain, as well as the possibility of a muscle strain, femoral hernia, inguinal hernia, ostetts pubis, pelvic stress fracture, hip arthritis, hip adductor muscle strain, or abdominal organ pathology.

References